

Attorney Dkt: 839-377  
Runkle, Mark A. et al.  
Serial No.: unknown (FWC of SN 08/550,941)  
Group Art Unit: 2111

1. {ONCE AMENDED} An electrical interconnection system  
comprising:

a rotary transformer for coupling to a first electrical  
system and to a second electrical system, the rotary transformer  
comprising:

a rotor connected to the first electrical system;

a stator connected to the second electrical

system;

a controller which adjusts an angular position of the  
rotary transformer, the controller comprising:

a first control unit which compares an input order  
power signal  $P_o$  to a measured power signal  $P_i$  being transferred  
between the first electrical system and the second electrical  
system to generate a requested angular velocity signal  $\omega_o$ ;

a second control unit which compares the requested  
angular velocity signal  $\omega_o$  to a measured angular velocity signal  
 $\omega_r$  of the rotary transformer to generate a drive signal  $T_o$ .

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8. 1. {ONCE AMENDED} [The system of claim 6,] An electrical  
interconnection system comprising:

a rotary transformer for coupling to a first electrical  
system and to a second electrical system, the rotary transformer  
comprising:

a rotor connected to the first electrical system;

a stator connected to the second electrical  
system;

a controller which adjusts an angular position of the  
rotary transformer;

a torque control unit for rotating the rotor, wherein  
the torque control unit is a motor; [,] and [further comprising]

a gear for interfacing the motor with the rotor.

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10.  
11. {ONCE AMENDED} [The system of claim 6,] An electrical interconnection system comprising:

a rotary transformer for coupling to a first electrical system and to a second electrical system, the rotary transformer comprising:

CH  
a rotor connected to the first electrical system;

a stator connected to the second electrical system;

a controller which adjusts an angular position of the rotary transformer;

a torque control unit for rotating the rotor, wherein the torque control unit is integrated with the stator and the rotor.

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15. {ONCE AMENDED} A substation for electrically interconnecting a first electrical system and to a second electrical system, the first electrical system and the second electrical system having a differing electrical characteristic, the substation comprising:

C5

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a step-down transformer coupled to the first electrical system;

a step-up transformer coupled to the second electrical system;

a rotary transformer coupled to the step-down transformer and to the step-up transformer, the rotary transformer comprising:

C5 a rotor connected to a first of the step-down and step-up transformers;

a stator connected to a second of the step-down and step-up transformers;

a controller which adjusts an angular position of the rotary transformer so that a predetermined power is transferred from the first electrical system to the second electrical system, the controller comprising:

a first control unit which compares an input order power signal  $P_o$  to a measured power signal  $P_i$  being transferred between the first electrical system and the second electrical system to generate a requested angular velocity signal  $\omega_o$ ;

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C5  
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a second control unit which compares the requested  
angular velocity signal  $\omega_o$  to a measured angular velocity signal  
 $\omega_r$  of the rotary transformer to generate a drive signal  $T_o$ .

19. {ONCE AMENDED} [The system of claim 17,] A substation for  
electrically interconnecting a first electrical system and to a  
second electrical system, the first electrical system and the  
second electrical system having a differing electrical  
characteristic, the substation comprising:

C6  
a step-down transformer coupled to the first electrical  
system;

a step-up transformer coupled to the second electrical  
system;

a rotary transformer coupled to the step-down  
transformer and to the step-up transformer, the rotary  
transformer comprising:

a rotor connected to a first of the step-down and  
step-up transformers;

a stator connected to a second of the step-down  
and step-up transformers;

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C6  
a controller which adjusts an angular position of the  
rotary transformer so that a predetermined power is transferred  
from the first electrical system to the second electrical system;

Concl'd  
a torque control unit for rotating the rotor, wherein  
the torque control unit is integrated with the stator and the  
rotor.

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25. 2/. {ONCE AMENDED} A method of interconnecting two electrical  
systems, the method comprising:

C7  
coupling a rotor of a rotary transformer to a first  
electrical system and a stator of the rotary transformer to a  
second electrical system;

adjusting an angular position of the rotary transformer  
so that a predetermined power is transferred from the first  
electrical system to the second electrical system, the adjusting  
being performed by a closed loop angular positioning control  
system which operates the rotary transformer for transferring  
power from the first electrical system to the second electrical  
system.

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